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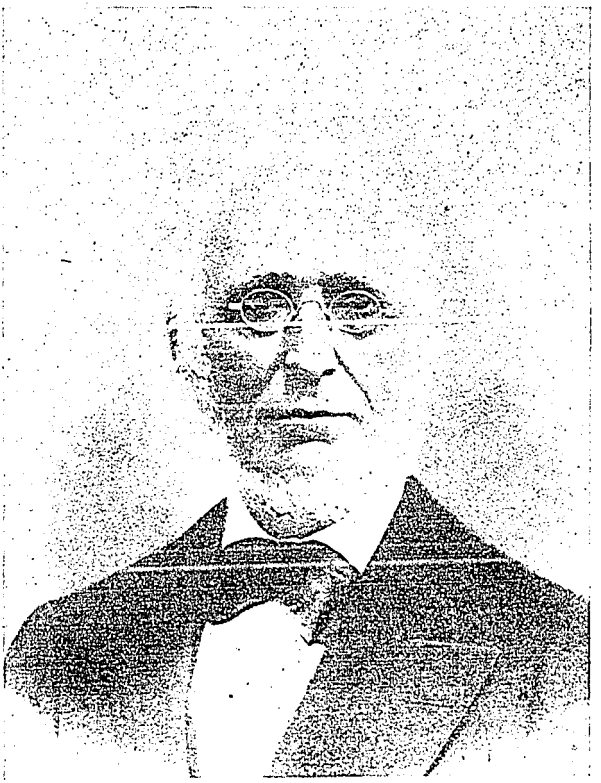

HON. SAMUEL N. CASTLE.

First President of Hawaiian Sugar Planters' Association. 1882.

Died in Honolulu, July 1894.

The latest quotation of sugar in New York at hand is $3\frac{3}{4}$ cents for centrifugals, 96° with no immediate prospect of a change.

Secretary Wilson estimates the American beet-sugar production for the current year 1901 at 100,000 tons. The cane crop he estimates as follows: Southern States 300,000 tons, Porto Rico 100,000, and Hawaii 300,000—a total of 700,000. His estimate for the beet crop is probably too high, by ten or twenty thousand tons.

Mr. Licht publishes an estimate of the new beet sugar crop of Europe ranging from 6,185,000 to 6,715,000 tons, against a production last campaign of 6,068,994 tons. He seems to favor the mean of these two extremes, or a total of 6,445,000 tons, which would show an excess of 375,000 over the crop of last year.

The director of Agriculture in the island of Mauritius has kindly sent us a copy of his annual report (in French) for the year 1900. It covers twenty-six pages, and gives details of the rainfall, temperature, laboratory, work in the sugar house, manures, etc. etc. The publication is issued only once a year, but is no less welcome on that account, and we shall be pleased to receive any future issues of it it or other publications sent out by the director.

The publishers of the Sugar Planters' Monthly have decided to issue portraits of the Presidents of the Sugar Planters' Association from its organization in 1882. The first appears in this number—that of the late Hon. Samuel N. Castle, who was one of its most active and influential supporters. He was a native of New York State, a resident of Honolulu for nearly sixty years, and was engaged in mercantile and sugar plantation industries during his long residence here. To him, perhaps, more than to any other person, is due the success of the sugar industry, which has given Hawaii prominence abroad.

Ireland is capable of growing 30,000 tons of sugar per annum, a quantity sufficient to put a large area of the island under cultivation; while to refine the sugar ten or twelve factories would be required, giving employment to many men,

women and children. What is wanted is capital; but as we take 1,700,000 tons of sugar every year from the foreigner and pay him twenty millions sterling for it, there is every encouragement for capitalists to put money into Irish agriculture, sure of a handsome profit on the outlay. At least five millions sterling would be the annual turnover of the Irish sugar industry; and there are subsidary industries to which it would give rise. The beets, for instance, after the sugar had been extracted, make splendid cattle food, and in that and in other ways Irish agriculture would feel the benefit; a new Ireland would be created. There is no reason why the United Kingdom, as we stated, should not grow all its sugar. England and Wales are capable of producing 600,000 tons per annum, Scotland 400,000, and between them they could supply every home and keep the twenty millions that now go to the foreigner every year, in John Bull's pocket.—Manchester Dispatch.

COFFEE.—One-half the world's production of coffee berries is brought to the United States. Americans are the greatest coffee drinkers on the face of the globe now, and every year the consumption of coffee is increasing here. Last year it was more than 80,000,000 pounds for the whole country, or more than ten and a half pounds a head of the population. Germany and France together only consume half as much coffee. Germany, less than six and a quarter pounds per head, and France only four and a half pounds per capita. The United Kingdom used little more than half a pound of the berries per head of the population, but over there they made up for it by drinking more tea than any other nation. More than a million dollars is sent out of the United States every week in payment for coffee. South and Central American countries, which supply us with more than 6,000,000 pounds of coffee a year, get most of the money. Porto Rico, Java and the Philippines get almost all the rest, but a little goes to Hawaii. Last year the total value of the coffee imported into the United States was about $60,000,000, and that was less than for several years, because the import price of coffee has fallen about one-half.—Bradstreet's.

An immigration restriction bill is before the Australian Federal Parliament. The Labor party intends to propose a

new clause prohibiting the entry of any person under contract to labor within the limits of the commonwealth. This would keep out an English clergyman appointed to an Australian bishopric, or a Scotchman appointed to manage a railway.

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A BEAUTIFUL TRIBUTE.

Among the many tributes to the late President McKinley, few can be found more touching and eloquent than the following from the New Orleans Sugar Planter:

"The entire nation unites in mourning for our dead chieftain. His death served to show that there no longer exists any party feeling between the North and South. In the removal of President McKinley, the South realizes that it has lost a truer friend than any President since the late civil strife has proved himself to be.

"Besides having caused himself to be acknowledged by the whole world as being a true type of an American, patriot and statesman, he had endeared himself to all by his unswerving fidelity and love to his invalid wife, who is, as if by the irony of fate, left to mourn him who was always so strong and brave.

"Tributes extolling the worth of the man have been expressed by representatives of all the foreign countries and by thousands of eminent personages. Too much in his praise cannot be said, for few Presidents of the United States have ever lived to see their governmental policy carried out and meet with such uniform approbation as has President McKinley. His policy for protection of home industries has placed this country on the sound financial basis it now stands, and caused industries to thrive where they had, under free trade's banner, failed. The sugar industry of this State is indebted to him for favors shown, and all realize that it would be in desperate straits if his protecive principles were not brought to bear upon the industry.

"With the passing away of a tried and true President, comes into office a new one, Mr. Roosevelt, whose future policy is expressed in this statement made by him immediately after taking the oath of office, 'It shall be my aim to continue absolutely without variance the policy of President McKinley for the peace and prosperity of our beloved country.' Having thus committed himself in a time of national

distress, when all were anxious as to the probable policy of the new executive and had nothing but good to say of the one pursued by President McKinley, Mr. Roosevelt would have hardly dared to state so plainly his future plan of government did he not mean to follow it out. He has done wisely in expressing himself as he did; let him see to it that he gives to the South the same recognizance of its industries as accorded to it by his lamented predecessor, whose strongest recommendation for a second election was the general prosperity experienced throughout the land during his first term."

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PREDICTION FOR SUGAR.

The following appears in one of our exchanges: "As there has been some talk of an attempt to remove the tariff on sugar, it is interesting to show how unfounded such a story must be. This year's world crop of beet and cane sugar will be about 6,000,000 tons of beet sugar and 3,000,000 tons of cane.

"If the Hawaiian sugar crop, amounting this year to 300,000 tons, and the Cuban crop to 600,000 tons, be considered part of the United States, then the total crop would be 1,250,000, or a million tons less than the consumption. In a year or two the Cuban crop is likely to reach 1,000,000 tons.

"In spite of a tariff of about $30 a ton, in spite of the continually increasing quantities of beet sugar raised in the United States, this million tons must be imported, and is imported from China, Java and other countries where the average laborer is paid in wages fewer dollars a year than the beet or cane sugar laborer receives here in a month.

"There being a greater supply the world over than in required for consumption, any effort to crush the beet sugar industry of the country by removing the tariff would be to bring in enormous quantities of beet sugar and cane too."

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Dr. Wiley declares that oleomargarine is totally unlike natural butter. There can be no doubt about that since the list of ingredients entering into the making of oleo were officially published. We commend this article, and trust all of our readers will give it careful consideration.

ANNUAL MEETING.

The Annual Meeting of the Hawaiian Sugar Planters' Association will be held at its rooms in Honolulu on November 18th and 19th. W. O. SMITH, Sec'y.

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HIGH-SPEED ELECTRIC TRACTION AT BERLIN.

For several years past, it has been recognized by scientific men in Germany, as elsewhere, that cars driven by electricity which have practically displaced the horse car as a means of intramural and suburban travel, would sooner or later dispute the supremacy of steam railways for long-distance passenger traffic. The main governing motive for such a transformation would be the greatly increased speed that could thereby be attained. It was felt, however, that the high-speed problem involved many details of construction and practice concerning which comparatively little is known. No careful engineer or capitalist would enter upon the construction of a high-speed railway for actual service until the whole subject had been thoroughly studied and its feasibility proven by practical demonstration. After more than a year of study and experiment with motors, conductors, and especially with the task of taking up an electrical circuit by a motor moving at high speed, Director Rathenau had a formal interview with the German Emperor, in which he submitted a plan for using as an experimental electric line the military railway leading southward from Berlin to Zossen, a distance of 18 miles. The proposition of Mr. Rathenau was promptly and fully approved, and from that moment the whole scheme has had the active support of the Imperial Government. The line to Zossen is now in process of preparation for the trials which, it is expected, will begin in August or September. For these experiments two motor cars will be, or have been, built—one by the General Electric Company, the other by Messrs. Siemens & Halske. Each will carry about fifty passengers, and efforts will be made to attain a speed of from 125 to 150 miles an hour.—U. S. Consular Reports.

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It takes nearly a year to raise a hog—several years to raise a beef—but only a few months to raise a chicken and only a few days to get a supply of eggs.

SUGAR CANE SEEDLINGS. SOME QUEENSLAND EXPERIMENTS.

In the Queensland Sugar Journal for September, we find the following interesting account of successful efforts to obtain seedling sugar canes, from which some valuable results may be obtained.

Those who are familiar with the literature relating to sugar cane are aware with what persistence the possibility of utilizing seminal production as a means for raising varieties possessing desirable qualities is dwelt upon. Many of those both directly and indirectly associated with sugar growing industry of Queensland have moreover been fully impressed with the importance of this consideration. This has especially been so in the case of the Colonial Sugar Refining Company that amongst its many undertakings, in which scientific method has good place, has availed itself of every opportunity for endeavoring to aise new cane varieties by the method alluded to. Amongst those of its officers to whom the attempt has been especially relegated may be mentioned Mr. J. Clark, an enthusiastic investigator who after serving the Company in various capacities, in the several districts to which its operations extend, is now attached to the Hambledon Plantation, Cairns, as Agricultural Experimentalist. For the last five or six years this is a work that has persistently commended itself to his attention. And both at Keith Hall in New South Wales, and at the Victoria and Hambledon plantations in Queensland he has during this period, essayed to raise cane from seed for this purpose prosecuting every method found efficacious elsewhere or even such as has been suggested as being likely to, by those that have given attention to the subject, in causing both the seed of sugar cane as well as that of many other plants to germinate. Until quite recently, however, all his efforts were in vain. At first he concluded that the soil used for his experiments was in fault but having found that seeds of almost every variety of plant sprouted and grew in soil of a similar kind, and subject to the same conditions as those that he had made use of, he had to abandon this as the explanation of his non-success. He then formed the opinion that sugar cane seed derived from fields in which only one variety of cane grew was naturally infertile as the result of continuous self-

fertilization. Not only had his own experiment been attended by negative results, but the attempts of the numerous farmers resident upon the Clarence, Richmond and Tweed rivers of New South Wales, and of their wives, all of whom have been stimulated in their efforts by a promised monetary grant made on the part of the company, had been similarly unsuccessful. With regard to his investigations having for their object the raising of cane seedlings at Hambledon plantation it may be stated that for two seasons in succession they were wholly successful. In the meantime it had been suggested by Dr Kortmann, chief chemist to the C. S. R. Company, that different varieties of sugar cane growing upon the same plot of ground and arrowing at the same time might naturally cross fertilize and that if this should happen fertilized seed might result. During the last few months. Mr. Clark has had under his control at Hambledon a plot of 10 acres in extent in which no less than eighty nominal varieties of sugar cane were being grown side by side. These varieties comprised a representative collection of the large number of sugar canes obtained in British New Guinea by Mr. H. Tryon on behalf of the Department of Agriculture some four or five years since. Here then occurred a favorable opportunity for testing the merits of Dr. Kortmann's suggestion and an ideal place wherein to obtain fertile sugar cane seed were it well founded. The climatic conditions that have obtained in coastal districts of Queensland during the few months have been especially conducive to arrowing. And the result has been that of the above mentioned eighty varieties no less than thirty manifested this phenomenon. Too many series of experiments were prosecuted. In his first successful attempt Mr. Clark employed a mixture of seed derived from inflorescences of several different cane-varieties that were sufficiently advanced in growth to admit of the possibility of the object in view being realized. This alone proves that cane plants grown under Queensland conditions of climate produce fertile seed. In his next that the definite percentage of the plants raised might be determined, he sowed the seeds from these thirty varieties in distinct seed-boxes. This second experiment resulted in the germination of the seeds of no less than sixteen varieties—this number including eleven occuring exclusively in the Tryon collection

of New Guinea canes, the balance comprising Kew Seedling, Striped Singapore, Black Fiji, Salangore and Purple Noumea.

With regard to the method adopted in effecting the germination of the seed and the further growth of the young plant, it may be stated that Mr. Clark found that this was secured most favorably by using a hot bed composed of rotting stable dung, above which was placed six or seven inches of light loam of good quality derived from the surrounding cane lands. That the young seedlings might not be choked by weeds on their first appearance, he collected this soil a month or two prior to its being required for use, spread it out and maintained it continuously in a moist condition. Each weed was then immediately destroyed on its putting in an appearance. This somewhat tedious procedure was replaced in some cases by sterilization of the soil with heat. It was, however, found that germination and after-growth were much interfered with when this method was resorted to. The watering was accomplished from beneath by taking advantage of capillary action. The seedling might be obtained, though with difficulty it is true, even when the glass was unshaded, provided that the suitable conditions of warmth and moisture were constantly maintained. It was found, however, germination was most active and early growth the more vigorous when the glass was obscured. Especially was this the case when the shade was red, a condition arrived at by employing Turkey-red screens to cover the glass. The seed was not covered with soil but was simply dusted over the surface. Moreover, an attempt was made to winnow it from the seed-glumes that enclosed it. Insomuch also as ants might, if established in the seed beds, considerably interfere with the young plants in the earlier stages of their growth, or even remove the seeds themselves, these were excluded by isolating all the hot beds on legs standing in salt water. Germination with the resultant young plant would be accomplished in from three to four days. The first young plants appeared on 22nd July from sowings made on the 18th. At the time of the writer's visit, Mr. Clarke had under observation fully 100 receptacles holding diminutive cane-plants, some fifty of which had already been transplanted and established into tin bilies, kerosene tins, &c., and were still growing either under frames or in the open. Hundreds and hun-

dreds of seedlings were in fact readily discernible. The successful result referred to was not of course secured without due regard to other minutiæ, whose nature could best be understood by inspecting the operations themselves. In this connection it may be mentioned moreover that Dr. Reed, the able manager of Hambledon,who had not only afforded every facility for the prosecution of the work, but has also displayed great interest in the results secured, offers every inducement to those who are desirous of repeating the experiments and are therefore anxious to master the necessary details to be observed in order to secure similarly successful issues for their undertaking, to come and see for themselves. This in fact has already been availed of by the Acclimatisation Society, for its overseer on making a special visit to Hambledon plantation early in the course of the present month, was not only permitted to master at his leisure the technique connected with the proceedure, but also granted full access to the arrowing cane whence the fertile seeds had been secured. And that he profited by the object lesson thus afforded him will, there are grounds for concluding, be shown by the results of the germinating experiments, that he immediately afterwards initiated whilst still sojourning in the Cairns district. In conclusion it may be added that it is matter of congratulation that, after pesistent efforts, Queensland now promises to be in a position to furnish the important agriculturists of sugar-growing with new and distinct cane varieties whose qualities may make for its further advancement.

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Proposed Steamship Line between Java and San Francisco. —Consul Rairden sends the following from Batavia, May 30, 1901.

The Koninklijke Kapetvaart Maatschappij (Royal Packet Company), of this place, proposes to open a steamship line between Java and the west coast of America, calling at Chinese and Japanese ports. Negotiations between this company and the Netherlands Colonial Office in relation to the amount of subsidy to be allowed by the Government have been going on for more than a month. The question arises whether the ships will obtain sufficient cargo at the American, Chinese, and Japanese ports to make it pay. It is to be hoped that the trial will be made, and I feel confident

that American merchants will be glad of this opportunity for direct shipments to Dutch Indian ports. Should this line be opened, San Francisco will be the American port of call, touching, probably, at the Hawaiian Islands on the outward and return passages.

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THE LARGEST SUGAR PLANT IN THE WORLD.

Mr. R. B. Hawley of Louisiana, an ex-Congressman, and sugar planter in the Southern States, has become interested in a large enterprise in Cuba. A private syndicate of which he is the head has secured 64,000 acres of the finest land in Cuba which they intend to plant in sugar canes for export to the States. This has caused something of a sensation in planting circles, and the opinion has been expressed that the competition which will result will seriously affect the Louisiana sugar industry. According to the "Picayune" Mr. Hawley has shipped to Cuba the largest sugar manufacturing plant that has been made in America, or, for that part, in the world.

The name of the company is the Chapparra Sugar Company, its domicile New York, and the plantation is situated at Puerto Padre, Cuba, extending over many miles of territory and embracing 100 square miles of the finest sugar lands on the island.

The crushing plant was built by the Whitney Iron Works, New Orleans, and consists of six Corliss engines, of 150, 250 and 30 horse power, two of each size.

Two sets of nine-roller mills, with Marshall crushers in each, the rollers seven feet by thirty-four inches, fitted with hollow steel shafts, built at Bethlehem, Pa.

This is only the crushing plant, and that alone was built here at a cost of something more than $150,000.

The boilers were produced in New York. They are of 6,000 horse power, of the Babcock & Wilcox type, 40-tube boilers.

The refinery plant was bought in Philadelphia, with the exception of one machine, which was proprietary, and had to be produced in Europe.

The refining plant consists of three 13-foot vacuum pans, two sets of triple effects, of the Lilly type, twenty-four crystallizers in motion, and twenty-four water-driven centrifugals.

The capacity of the mills and refinery is 3,000 tons per day, and it is proposed to increase the plant at the earliest mo-

ment, as it will not be sufficient for the needs of the company another year.

The company has several locomotives, and a complete transportation plant on the island already, which will be extended as the land is gradually brought into cultivation.

The Deming system of clarification is to be used in the refinery, and the inventor of the system is now building the plant for the company at the Payne-Joubert works in New Orleans.

This is the largest single consignment of machinery that has ever gone out of the city, and it is to be followed by more from the same source for the same company. Altogether it will constitute the largest sugar cane cushing plant on a single plantation in the world.—New Orleans Picayune.

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THE AMERICAN SUGAR REFINERY'S SCHEME.

There is strong effort now being made in the United States to remove all duties on foreign sugars, and to retain them only on refined. It is practically a fight between the refinery interest and the growing beet industry. With protection the beet industry promises to increase rapidly, though at present it supplies only about one-fifth of the entire consumption of the United States. The New York sugar refinery appears to be the active agent in this move, hoping thereby to control the refining trade by securing the sugar crops of Cuba and Porto Rico, which it can, if everything works favorably. Commenting on this sugar war, the Manchester Sugar Journal has the following:

"The question of the future position of Cuba towards the United States is one of very considerable interest to the entire sugar world. The rate of progress in development of the Cuban sugar production is largely dependent on the encouragement afforded to or withheld from the industry by the more or less advantageous fiscal relations with the United States. The present purveyors of a large portion of the sugar requirements of the latter country are therefore very largely interested in the matter. Among these the most seriously concerned are Java, Egypt, Germany, Austria-Hungary, and the whole of the West Indies and Demerara. But the most seriously affected country is, after all, the United States themselves, as regards the beet industry, which is now com-

mencing to make rapid progress. No wonder that the views as regards Cuba, which have lately been put forth by American refiners and the tactics which they are pursuing should excite great alarm in American beet-growing circles. The proposal to abolish the import duty on raw sugar while maintaining a duty of one-quarter pence per pound on refined, combined with the issue by the American Sugar Refining Company of $15,000,000 new stock for operating in Cuba and Porto Rico, producing raw sugar in those countries by cheap labor—Porto Rico sugar being now free, while it is not impossible that Cuban sugar may soon enjoy the same privilege—is calculated to excite grave apprehension among the beet sugar manufacturers. Under the present protective duty they are enabled by good management and with favorable conditions of weather to make good and even large profits, but if the favoring protective duty were abolished there is no doubt the rapid increase of cheaper produced Cuban and other cane sugar would rapidly extinguish the nascent industry. The intended action of the refiners and the proposals which they are certainly intending to favor in the next session of Congress are, therefore, a direct menace to the beet sugar factories, and Mr. Havermeyer and his friends, who represent the latter, are preparing to take action, and when we consider the large interests at stake, and the amount of capital involved, it is quite clear that there is likely to be a tough fight. The Louisiana and Hawaiian planters are concerned in this matter, and it is certain that they will make their voice heard.

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VALUABLE WORK.—To those interested in arboriculture, the list of foreign trees introduced into these Islands by Professor Koebele will prove a surprise. The entire list will number about 250, and many of them, it is thought, will prove to be valuable for various purposes, not the least being new varieties for cabinet work, housebuilding, shipbuilding, and other useful industries. In making his selections, all trees known to be worthless or injurious have been discarded; still, some may prove to be such here, and those will be dropped out whenever their true character is known. But the fact that such a large number have been successfully introduced is evidence of diligence on his part to secure what he has. Hawaii may soon be able to boast of a larger variety of useful plants and trees than is possessed by any other country.

THE SUGAR TRUST AND BEET SUGAR.

In the years before beet sugar began to take rank among the important products of the United States, sugar used to go up, in the wholesale and retail markets, about the same time that the fruit canning season opened in late summer. The demand became unusually heavy then, and the sugar refiners found a ready excuse for taxing the traffic about all it would bear.

This process was carried farthest and made most effective by the American Sugar Refining Company, after that corporation, better known as the sugar trust, absorbed enough refineries to virtually control the entire country east of the Rocky Mountains. Its officers played with the market very much as a cat does with a mouse, and the consumers paid for the fun.

This season the price of sugar has been low, all the while, in comparison with other commodities, and also if judged by the current quotations of former years. In the summer of 1900 the market was decidedly higher. Yet the sugar trust then made a sharp reduction in its selling prices at a time when such changes are unusual. It is giving the country cheaper sugar than any one could reasonably have expected.

No man who has the least knowledge of the record and characteristics of the American Sugar Refining Company is simple or ignorant enough to attribute such tactics to broad moderation or to kindness of heart. The trust is neither becoming generous and philanthropic, nor is it taking the longest possible look ahead and striving to encourage the largest and freest use of sugar.

The beet sugar interests of the country feel certain that they understand the motives of the big monopoly. They see in its price-cutting a desperate effort to discourage the form of competition which the American Sugar Refining Company has most reason to dread.

Beet sugar works are beginning the season's operations in the West. Their busy time is at hand everywhere. The harder the market conditions can be made for them during the next few months the less capital they will have to invest in enlarged plants, and the less favor they will find in the estimation of men with large financial resources who may be

looking for good investments. The independent sugar interests believe that the sugar trust is trying hard to cripple beet sugar making in the United States, at the earliest possible moment.

All the indications are that this theory is correct. The trust has every reason to fear the growth of the beet sugar industry. Already that new form of productive activity in the United States has become a matter of vital importance to thousands of farmers and many entire towns. Communities scattered through several states feel that upon the success of beet sugar their future must depend, in large measure.

Voters interested in beet sugar are sure to oppose vigorously sugar trust schemes for the removal of the duty on foreign raw sugar and the retention of a duty on the product of its refineries. It is well understood that without any protection on raw sugar the farmers of the United States could not or would not try to compete with the cheap labor and easy tillage of the sugar cane islands of the West Indies. The moment they stopped the growing of sugar beets in sufficient quantities to insure steady supplies for the best sugar works the domestic sugar industry of the American republic would be crippled, and the sugar trust would be the master of the whole field which it has so ably and mercilessly exploited.

These facts explain the eagerness of the trust to blight the beet sugar industry. They account for its willingness to cut prices in the middle of summer and its zeal in developing West Indian sugar production. The natural peril of the sugar trust is the American farmer who grows beets for sugar. He can be multiplied to the extent of gaining great political power, and he cannot be syndicated and absorbed. He will not tolerate the removal of the duty on raw sugar, to his own hurt, with protection still given the sugar trust for its further aggrandizement and the increase of its wealth.

It is quite probable that the next session of Congress will witness a struggle for life by the beet sugar interests of the country against the machinations of the sugar trust. It is desirable that all neutral classes should understand in advance what the agents of the sugar trust will mean when they propose the removal of all duties on raw sugar and the retention of full protection for refiners. They may talk of cheaper sugar, but they will be aiming to smash and wipe out of existence the only force which now keeps down the price

of sugar and forces the American Sugar Refining Company to lower its market quotations at the beginning of the canning season.—Exchange.

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THE U. S. DEPARTMENT OF AGRICULTURE.

Among the various works of the government, none is more useful that that devoted to agriculture. Each year a new volume is issued by the Secretary of Agriculture, devoted to this branch of the public service, the receipt of a copy of which is now acknowledged. It is a large octavo volume of nearly 900 pages, with over 250 illustrations of topics referred to in the work. In the opening chapter of the volume before us, the improvement in fig culture is taken up, and the introduction of the Smyrna fig advised, with instructions how to introduce the Blastophaga insect, which makes these figs so superior to all other kinds. Its introduction into California dates back about ten years, through its successful culture extends only three or four years back, from importations made by the United States Department of Agriculture, which sent agents to Smyrna to superintend the work. Fortunately, no injurious parasites of the insect came with the plants, or have thus far been found on them, though they are said to be numerous in Smyrna. The success of the Smyrna fig culture in California for the past two or three years shows that it may become a prominent industry in that State, and if there, why not in Hawaii? There are three varieties of the Smyrna capri fig cultivated now in that State, and all appear to be doing well. If success can be attained there, why may it not be here in Hawaii? The consumption of Smyrna figs in the United States in the last year's report is stated to have been $382,784 in value.

Some forty or fifty years ago figs were cultivated and cured in Kona, Hawaii, and found a market here and in California, but owing to high charges for freight and commissions, the business was abandoned, though the quality of the figs was not surpassed by any from Smyrna or elsewhere. But there can be no doubt it would pay now, especially if conducted on a large scale. The fig tree grows well on all our islands, but the lee sides are better adapted to curing the fruits properly, as more sunshine and less rain prevail there, and the fruit obtains a better flavor, when well dried in the sun, and the process is less expensive than when artificially dried.

IS CANE OR BEET SUGAR THE SWEETER?

Several years since we entered into a long discussion relating to the comparative value of cane and beet sugar. We then pointed out that the two sugars were identical from both a chemical and physical standpoint. We stated also that upon general principles it might be admitted that if there was a difference it was due mainly to the fact that one of these sugars was generally alkaline, and the other acid, which might form a preliminary method of distinguishing between the two. We suggested that a series of experiments be made with lemon juice and water, and that a certain number of persons were to taste lemonades sweetened with a given amount of both sugars. We have since then made the experiments and are more than ever convinced that the two sugars from a sweetening point of view, are identical. The reason that raw cane sugar is sweeter than raw beet sugar is that the former contains a smaller percentage of salts than the latter; these salts, however, conveying, in the case of cane molasses, a sensation of sweetness that even white sugar does not possess. The reason is explained by the stimulation caused by the salts upon the organ of taste, the transmission to the brain then being more rapid than it is in the case of refined white sugar that must first melt in the mouth before we realize that it is sweet. The Louisiana Planter has been discussing the question of cane and beet sugar, and says that a well known professor declares himself in favor of the blindfolding method with various sugar solutions, and taking an average of the judgment as to any apparent sweetness. We beg to state in this writing, as we have previously done, that such tests should be made side by side, not only with two sugars of the same polarization, but having been refined by identical modes. If this factor is not taken into consideration the results obtained would be very misleading. There remains a whole field open for a series of investigations to show just within what limits refining processes of various countries influence the sweetening power of a given weight of sugar. This question, to our knowledge, has never been discussed in the leading textbooks.—Utah News.

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Apartly worn out broom may do good service in the poultry house. The tidy poultry keeper will find many uses for it.

AN ALPHABETICAL LIST OF VERNACULAR AND PROPER NAMES OF PLANTS INTRODUCED INTO HAWAII BETWEEN 1894 AND 1900, WITH SHORT NOTES THEREON.

By A. Koebele.

I deem it advisable to compile a list of the seeds and plants introduced into the Islands during my travels, as Entomologist, in foreign countries, the same had been completed and was handed over to the Commissioner of Agriculture for publication during September 1900.

No accurate notes were kept during the first two years; the names, whenever obtainable, having been sent with seeds, and doubtless some are herein omitted.

In 1894 I obtained from the Colonial Sugar Co., on the Johnstone River Queensland, their seven best varieties of cane, which at the time were sent to Commissioner of Agriculture, Marsden, with chemical analysis. No mention has been made of same.

Leaving the ornamental plants aside as unimportant, we want all those of any economic value and tropical nature. With a little knowledge and interest in the subject, we shall be able to successfully raise almost any of the most delicate fruits known, such as the Mangosteen and Durian. The former has been bearing fruit at Mr. Gay's place on Kauai since 1897. It is the only tree that survived, as far as known, out of a lot of twenty-three imported by the late Mr. Jaeger.

The single specimen of the original imported Durian trees is growing at the Wilcox garden at Lihue, Kauai. It has been bearing the last few years and many young trees have been planted out from its seeds.

At the McBryde's, on the same Island, we find the Kola nut in bearing.

Of less importance, yet nevertheless of interest, are the nice trees of the Indian Bhel-fruit growing in the garden of Mr. Robinson.

We already have varieties of Sapotas and Anonas growing and others soon coming into bearing.

The Eugenia and Guava are numerous and varied, producing excellent fruits, quality and use of same as yet not perfectly understood.

Every known variety of Citrus tree is at home in our

islands, producing excellent qualities of fruit the year round.

Fig trees are growing well and produce fruit continuously.

Pineapples and Bananas will in time form a large and very important export article.

It will not be long with such men as the Hon. Mr. Damon at the head, until the Hawaiian Islands lead the world in varieties and quality of Mangoes and Alligator pears.

Efforts in the direction of producing superior tropical fruits for the mainland are more desirable than to furnish them with vegetables growing more luxuriantly there than here. Desiduous fruits are very well, but altogether out of place on our tropical islands.

We should endeavor to improve the Taro plant, which in some localities at least has greatly degenerated, by introducing new varieties and proper fertilizer. Those sent from Fiji Islands surpass any in size here.

Peronosporum Trichotoma has caused vast destruction on the crops of this tuber in the Antilles, as well as on these Islands.

In Yams—(Dioscorea), we find the finest esculent roots of the globe containing as much as 24 per cent of starch, (D Elata) and, as in D. Atropurpurea, 7 per cent of sugar.

Owing to the presence here of the Mellon-fly, "Dacus Cucurbidae," we have failed to introduce the Chayote, Sechium Edule, so largely grown in Mexico and the West Indies for the sake of its large mellon like spiny fruit, and tubers up to 20 pounds in weight, containing about 20 per cent of starch, in appearance and taste not unlike a yam.

We should plant even oaks, coniferous and other trees at higher elevation where the tropical trees will not succeed, and valuable forest and timber trees lower down.

Hundreds of valuable trees could be selected to grow successfully in the salt marshes up to the highest elevations. We should plant the Kauries largely. They produce the most durable timber of all Coniferae.

The Teak is another tree growing well on these islands.

Afzelia byuga with its handsome dark green dense foliage producing plenty of shade so essential for a forest, will make one of the most valuable trees.

The grand Cryptomeria Japonica, the largest tree in Japan, with trunk 35 feet in circumference and 120 feet in height, with durable timber more extensively used at home

than any other, is growing as well with us. We have seen at Olaa, twigs of this tree cut up in short lengths and stuck in the ground producing young trees in a very few weeks.

The most vital question on which the future prosperity of the Islands depends, is the preservation of our continually decreasing forests, unless very rigid measures are brought into bearing, instead of improving, our agricultural industries will steadily decline.

No animals must be allowed to roam over the country and forests. Laws must compel their owners to fence them in. Competent men should decide in what districts and up to what elevation cattle should be allowed.

By introducing the Panicum Spectabile to replace the Hilo grass and furnish abundance of nutritious fooder for the animals, we are in hopes, in a measure, at least, thereby to save the forests.

NOTE:—In preparing these notes we have had access to, and quote from the works of Baron Von Mueller's Select Extra-Tropical Plants, Prof. Dr. Sadebeck Kulturgewaeechse der Deutschen Kolonien, and Selmer's Tropische Agriculture.

ABUTILON Periphlocifolium.—Seeds from Botanical Gardens, Suvas, Fiji, November 1899.

ADANTHERA (Albizzia) Devoniana.—Seeds from the Botanical Gardens, Peradeniya Ceylon, February 1900.

ACACIA Baileyana.—A small graceful ornamental tree. Seed from the Department of Mines and Agriculture, Sydney, N. S. W., January 1900.

ACACIA Farnesiana.—Indigenous to Southern Asia. The scented flowers inappropriately called "cassie" flowers are much sought for perfumery and develop successively. This species may well be utilized as a hedge plant; a kind of Gum Arabic may also be obtained from it.

ACACIA Sphaerocephala.—A small bushy tree or shrub with large furcate spines resembling bullock's horns. Will make an admirable hedge plant. Fiji, 1899.

ACER Species.—A rather small Maple tree growing extensively in parks and along roads in Mexico, both in higher and hot country. Seeds, Mexico, 1897.

AFZELIA Bijuga, A. Gray.—One of the most valuable of all timber trees; its hard, dark purplish red heart-wood takes a high polish and it is in great demand for cabinet work in

Europe, which market it reaches in blocks often more than three feet in thickness, and up to twenty feet in length; timber merchants in Fiji declare this to be the best wood known to them; said to be practically indestructible. I have met with this tree on these islands, where it is known under the name of "Vesi," anywhere along the seashore. An enormous tree, standing in a native crown spreading to about one hundred feet in diameter; in the higher forest the tree takes a more slender form, with a branchless trunk fifty to seventy-five feet in height; it is one tree selected by the native to build his canoe. Many seeds were collected and forwarded from the Fiji Islands and all the young trees are growing well here; it can be grown along the seashore, as an avenue or forest tree. It is found all over the Indo Malayan district, and is event present at Samoa from whence seeds could be obtained.

AGATHOPHYLLUM Aromaticum.—Madagascar. Used by the natives as a condiment. The fruit is aromatic, but encloses a kernel of an acrid taste. Known as Madagascar-Clove-Nuting. Seeds at Ceylon, February 1900.

ALIGATOR PEAR Persea gartissima.—Some nine to ten varieties of this fruit—from size of an ordinary fig to the largest known—were bought at markets of Pazcuaro and City of Mexico; during 1897, a large number of the trees were distributed.

ALBIZZA Lebbeck.—The Siris Acacia of Southern and Middle Asia, and Northern Africa. Available as a shade tree. It produces also a good deal of gum; the flowers are much sought by bees (F. V. M.) Seeds from Fiji and Brisbane, Queensland, 1899 and 1900.

ALBIZZA Odoradissima.—Seeds collected at Brisbane, Queensland, January 1900.

ALEURIDES, Sp. Var.—Seeds collected at Queensland, 1894, and at Suva, Fiji during 1899.

ALLSPICE. Eugenia pimenta.—Largely cultivated in the West Indies. Four young trees from the Botanical Gardens, Suva, Fiji, November 1899.

ALYXIA. Lanceolata.—Likely this species of "Maile" is grown extensively in native village at Fiji; seeds sent from the same place.

ALLAMANDA Violacet.—Cutting and suckers were sent

of this ornamental shrub from the Botanical Gardens at Suva, Fiji, 1899.

AMARATUS Tricolor.—Seeds from Levuca, Fiji, 1899.

ANDIRA Inermis.—A leguminous tree from the West Indies; known as the "Cabbage-bark tree." Its bark has a very disagreeable smell, and its used as a worm powder, but requires caution in its use, as it is highly narcotic. Seeds from Botanical Gardens, Suva, Fiji, '99.

ANONA Var. Sp.—Seeds from markets at City of Mexico during 1897.

ANONA Muricata.—The well known sour-sap, seeds from Ceylon, 1894.

ASH. Mexico. Fraxinus Sp.—A valuable tree growing well on the islands; extensively grown in parks, in Mexico, from where many seeds were sent during 1897; Cuautla, State of Morelos, Mexico.

ARDISIA. Crenulata.—A handsome ornamental plant for decoration purposes; it has numerous bright coral red berries that remain on plant for a long time if grown in a cool place; it did well at Suva, Fiji, under the shade of trees. Many seeds of same from Botanical Gardens, 1899.

ARDISIA. Sp.—Seeds from Hong Kong, China, March, 1900.

ARECA. Triandra.—An Indian Palm; seeds of same obtained at Ceylon, Feb. 1900. Not previously present on the Islands.

ATALANTA. Buxifolia.—A small leaved spiny shrub, belonging to the Citrus family; it will be very useful as a hedge plant; seeds from Suva, Fiji, and Hong Kong, China, 1899-1900.

AVERRHOA. Bilimbi.—A tree from 20 to 30 feet in height. It is cultivated in India and other countries for its fruit, which is oblong and pulpy, about 2½ inches long, and one inch across, and of a yellowish color; enormous quantities of this are produced. Large number of seeds from Botanical Gardens, Suva, Fiji, Nov. 1899.

AVERRHOA. Carambola.—I sent seeds of this tree during 1896 from Formosa and Canton, China, but it has been grown here in limited numbers previous to these; it is the better of the two.

BAMBUSA Vulgaris.—The late Dr. Bancroft of Brisbane advised me to introduce this highly ornamental and useful

Bamboo, the best of that extensive collection in Acclimatization Gardens of Queensland. The plant is doing exceedingly well with us, but will grow to better perfection on streams and ponds instead of the dry gardens. To Mr. Charles Ford, Director of the Botanical Gardens at Hong Kong, I owe my thanks for kindly sending this valuable plant, freight prepaid. 1895.

BARRINGTONIA Speciosa.—The "Hutu," or "Futu," as it is called by natives of the South Seas, is a large branching tree, attaining a height of from 40 to 50 feet, with a stem circumference of 10 to 14 feet; it has large, shining, ovate, eliptical leaves, and bears a profusion of large pink flowers. Its fruit is four sided and pear shaped, three to four inches across the middle, and consists of solid fibrous matter, having only one seed. When dry the fruit is used for fishing floats. From its seeds a lamp oil is expressed; mixed with bait they are used to inebriate fish, in order to facilitate their capture. The tree is found growing chiefly along the coasts, yet handsome specimens were seen on higher ground. It will make one of the best shade trees for our shores, and should grow remarkably well on places like Quarantine Island. Large numbers of seeds were forwarded from Fiji, Nov. 1899, and nearly all of them have produced fine plants.

BARRINGTONIA edulis.—So named at Botanical Gardens in Fiji. We have seen a similar tree in Botanical Gardens at Sydney, bearing the name of B. alba. A noble tree growing more pyramidal than the foregoing, with its large white flowers growing on stems, two to three feet in length. It bears a profusion of fruits about three and a half inches in length, the kernel of which is eaten by the natives, who have this tree generally growing around their houses. Seeds from the Botanical Gardens at Suva, Fiji, Nov. 1899.

BARRINGTONIA Sp.—Resembling the foregoing, but instead of the flowers being white, in this tree they are rose colored; the fruit is the same in size and shape as B. edulis. Without exception, these noble trees are beautiful objects when in flowers. Seeds from the Botanical Gardens at Suva, Fiji, Nov. 1899.

BAUHINIA acuminata.—Aside from being ornamental, these plants have also valuable medicinal qualities; the fibrous bark is used for rope, also for dyeing and tanning

leather, and the wood of Bauhinia Variegata is of a dark color and forms one of the woods called Ebony. Seeds of the above plant from Hong Kong, China, 1900.

BAUHINIA alba.—Seeds of same from Fiji and Ceylon. Flowers of this are entirely white.

BAUHINIA carnea.—A large semi-climbing shrub, with a profusion of flesh covered conspicuous flowers. Seeds from Acclimatization Gardens of Queensland, January, 1900.

BAUHINIA rosea.—Small tree with rose colored flowers. Seeds from Botanical Gardens, Suva, Fiji, November, 1899.

BAUHINIA Sp.—Seeds of two or three other species from New Caledonia, and Fiji.

BEILSCHMIEDIA Tarairi.—Northern Island of New Zealand. A forest tree 60 to 80 feet in height. The wood is remarkably straight in the grain, close but rather brittle, and easily split; it is frequently white throughout, but usually the heart is red. It is not durable when exposed. Seeds, Auckland, N. Z., December, 1899. .

BERRYA Ammonilla.—Two of these trees growing in Government Nursery deserve mention since they produce so many seeds at present. It is a native of Ceylon, the Philippines, and tropical Australia. In the former place it becomes one of the largest and most useful timber trees for building purposes, and is considered the best wood in the island for making oil casks. Being light and strong it is employed in the construction of the Massoola boats of Madras. It is exported in large quantities under the name of Trincomalee wood. It should be an easy matter to disseminate such a valuable timber tree with seeds growing here. The tree is not unlike a Linden.

BIGNONIA exoleta.—An ornamental climber. Seeds from Australia, 1900.

BOEHMERIA nivea. Var. Candicans.—The green Ramie. Plants obtained from botanical gardens at Suva, Fiji, are growing superbly at Government Nursery. The ordinary Ramie plant has been in cultivation a long time on the Islands, and large quantities of plants were seen growing above Hookena on Hawaii.

(To be Continued.)

BEET AND CANE SUGAR IN CALIFORNIA.

The following correspondence of the Philadelphia Sugar Beet contains much of interest to Hawaiian sugar manufacturers:

The press in general continues to discuss the question of the big fight, as they call it; time will tell and decide who is right. In the San Francisco Bulletin we noticed several paragraphs giving an excellent review of the situation: "The Grocer, which is doubtless authority in matters appertaining to its line, estimates the beet sugar crop of California at 100,000 tons. This would nearly or quite supply the demand for the section of the Coast controlled by the Western Sugar Refinery. But the Western Sugar Refinery is also exposed to the competition from the Hawaiian Islands, from which point an amount about equal to the beet sugar product is expected. There is apparently a considerable surplus of sugar which might be shipped east of the Utah dividing line, but for the fact that freight rates would somewhat more than consume the profits of production. The two refineries which are supposed to control the American market have sugar enough of their own, and, consequently, leave the independent refineries to find a market for their product. The Grocer said some days before the recent slump in sugar was recorded: "The outside factories will have one of two alternatives, that of seeking new outlets in a wider field or of disposing of sugar in the raw state to the two refineries." These new outlets lie east of the Utah line and west of the Missouri river. In that field, and further east, the Pacific Coast independent refiners would have to contend against the American Sugar Refining Company and the product of local factories in the same territory. Possibly the independent factories on this coast would find open competition on the western part of the coast more promising of satisfactory results than competition in the eastern market with a freight rate of $10 per ton to be added to the ordinary cost of production. The menace to our local sugar growers arises from the free admission of Hawaiian sugar, which is the product of cheap labor. The same menace hangs over the sugar beet growers of the East. Cane sugar can be produced in suitable localities more cheaply than beet sugar under possible conditions. Cane sugar is the product of cheap labor, while beet sugar, the product of tem-

perate zones, where the white standard of wages is maintained, is cultivated at a cost which can only be afforded by government aid. All foreign sugar except that from Hawaii and Porto Rico will have little effect upon the large eastern markets, but a 100,000-ton import from Hawaii into our small market is a more serious matter." The Examiner has some interesting effusions on the subject. "The opinion is general among sugar men that the only effect of the cut in refined sugar made by the trust will be to reduce the profits of the beet sugar men. That is will inflict any great loss is unlikely, for the reason that if the beet sugar men cannot market their product here they can ship it to Missouri river points and make a good profit there, or even send it still further east, where the trust could not afford to make a fraction of the cut that it has made on this coast, and where the trust already has its hands full trying to hold its own against the Arbuckles. Without pretending to absolute accuracy in the figures, the following sufficiently indicate the situation to show how hard it would be to inflict positive loss on the beet sugar men. Refined beet sugar can be produced at a cost of 3¼ cents a pound and cane at about 4½ cents. These costs in the best equipped establishments of both kinds would leave a small margin of profit. The freight rate on beet sugar to Missouri river points is 50 cents, and the price of beet sugar delivered there is 5.27, against 5.37 for cane. Deducting the 50 cents, the rate at the Oxnard factory doors would be 4.77. Supposing that the price of refined beet sugar remains here 10 cents below refined cane sugar, that is to say 4.90, then deducting the freight rate between Chino and San Francisco, which is 25 cents, the figure would be 4.65 at the factory door. Hence, if the rate be kept at 4.90 here, there is the difference between 4.77 and 4.65, or an advantage of 12 cents in favor of the beet sugar men in sending the sugar to Missouri river points. At the latter places, too, both the Arbuckles and the trust can deliver from New York, hence to cut the prices at Missouri river points would mean to bring into the fight much larger prices than are involved here. In other words, though a 50 cent slash of the trust made on this coast may cut off a portion of the profits of the beet sugar men, it cannot close the outlet to Missouri river points. Even though the trust were to make a still fur-

ther cut in the price of refined sugar, the only effect would be to cause the sending of more beet sugar to the Missouri river, where the cuts would not be so sweeping, if made at all, and where the quantity of sugar that could be delivered from this coast—being only about 10 per cent of the consumption of the United States—would make it a most expensive luxury for the trust. The great fight is still to come between beet and cane sugar. This the manufacturers of the latter well know is still perhaps a decade or more off. It will come when the beet sugar production of the United States begins to equal half the consumption, that is to say, when the amount raised equals the amount imported. Then, with the tariff off, the fight will come, and the smaller beet factories will probably go to the wall, only the powerful ones surviving. Had the price of refined sugar not been cut on this coast by the Spreckels-Havemeyer people and it had been from 5.50 to 5.75, the customary prices at this, the profits of the beet sugar men would have been much larger, for supposing refined beet sugar to sell at 5.40 and 5.65, then the price at the factory door at Chino would have been 5.20 to 5.65, as against a delivered price at Missouri river points of 5.27, equal to 4.77 at the factory door. Thus the beet sugar people, by the cut, lose their profits from 43 to 88 cents, and yet putting the cost of production at 3.25 they still have a very large margin of profit." At almost regular intervals the question of active effort to extend the cultivation of the sugar beet in the Sacramento Valley comes to the surface, yet from year to year comparatively little is accomplished. There is at present some agitation for the building of a factory in Tehama county, where sugar beets have been grown for several years past. Upon the Finnel ranch there are 1,500 acres devoted to beets. The freight of the expected 28,000 tons of beets to tidewater will cost $70,000. There would be a great saving by extracting the sugar on the spot. The Alameda Sugar Company has given notice to growers that the price of beets will be raised from the $4.50 per ton paid for several years past to $4.75. The campaign at the Spreckels' mill commenced September 3. The Index says: "There will be a larger force of workmen employed this season than last, and the mammoth engines and maze of machinery will be taxed to their utmost capacity. It is estimated that the

run will continue until after New Year, and more sugar will be turned out than at any time in the history of the factory. The Union Sugar Company commenced the third season's run on September 4. The officials are highly pleased with the favorable beginning which marked the season far ahead of others. The beets are coming in very fast and are far superior to any in the past years. The test thus far averages from 18 to 20 per cent, where in former years it was only 14 to 16. Aside from the company's 5,000 acres, there are about 3,000 acres of beets raised, which will insure the company a splendid run. The beets which have thus far been harvested look fine, and the farmers in general seem well satisfied. Where the beets have been sown early the crop is far larger than where it was planted late. The company finished up the brown sugar, turning out 250 tons. Mr. Hubert Dyer continues his search through the State in search of a suitable place to start a beet sugar factory. The San Joaquin was one of the places visited. At Bakersfield there is a geat scarcity of small farmers who could undertake sugar beet cultivation. Without doubt the rich alluvial lands near Visalia promise favorably. The sugar beet yield of Ventura county is estimated at 105,000 tons finished product, from an area of 11,000 acres. Farmers have been receiving $5 per ton. The irrigated lands have produced, on the average, an amount one-third larger than those not irrigated, and the percentage of saccharine has been equally high. The Oxnard Courier says: "The capacity of the factory is often stated as being 2,000 tons per day, but there is a modification that a number do not know of, and that is that these figures mean 2,000 tons of 15 per cent beets. Now, when 1,900 tons of beets with over 18 per cent sugar are ground in a day's time the factory is running considerably over its stated capacity. * * * The entire crop, it is estimated by agriculturists, will be 125,000 tons, which will mean an average of 11.36 tons per acre. The average amount paid per ton is $5. Thus, the beet farmers over the county, taking these figures, will receive $56.80 per acre, and of course, those having crops above the average, will receive much more. This will make the value of the entire season's product approximately $625,000. The value of irrigated land for beets has also been made very noticeable this season, the land on which water has been used going at least one-third better in tonnage than it would otherwise

have done, and just as high in percentage. At $5 per ton this would be quite an item to any farmer. Dry alkali land is going light in tonnage, but has everywhere exceedingly high percentage of sugar; in fact, of all the beets received from this type of soil this year none have gone below 20 per cent. The reports from the outside districts are also very encouraging. From Goleta the beets are fair in tonnage and high in percentage. The crop at Sucrosa is fine. On the company's land, a tract of 3,000 acres, in this district, the farmers have received the high average of seventeen tons per acre, with a very satisfactory per cent." The beets at Oxnard never tested higher, the averages are something extraordinary. I do not believe the assertion made in the Courier that on the Patterson's ranch an entire wagon load averaged 27.9 per cent of sugar; this may be said to be a botanical impossibility—they weighed in many cases only twelve ounces—but even then the exaggeration is self-evident. The beet season promises to close with a bitter fight between the growers and the factory unless some sort of compromise is speedily effected. This week the factory gave orders to growers for a single load per day from each. It is said the plowing of fifty acres of beets by one party caused the single load order. The factory did not see how it could handle the quantity to be delivered. To equalize matters and make it fair for all, one load a day was determined upon. The truth is that the crop is a great deal heavier than expected, the beets maturing much more evenly than usual, and the factory facing a greater immediate supply than it can handle. The result to the growers will be large loss. Many acres are plowed, and every day the beets remain on the ground they lose in value. With hot weather it is but a question of a few days when they will rot and become useless. At the factory an excellent run is being had. The machinery is working most satisfactorily. Beets delivered so far go high in percentage, being far superior to those of previous crops. A circular has been issued by Senator Jones, agent of the Chino factory, fixing the terms and prices for next year's crop of beets in this section. The growers are requested to send a full description of the land they propose to donate to sugar growing, so that it may be inspected and the contracts signed. Prices offered for the various grades are: Beets weighing not to exceed 5 pounds,

and testing not over 15 per cent sugar, $4.25 a ton, with 25 cents additional for a ton for each percentage over 15; beets weighing over 5 pounds and testing 15 per cent sugar, $4.25 per ton, with 25 cents per ton for each additional per cent, and 25 cents off for each per cent less than 15. Freight charges in all cases are paid by the factory. As these terms are better than those prevailing last year, it is expected the acreage next season will be increased. RIALTO.

San Francisco, October, 1901.

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SOILS—II.

Physical Properties Concluded.

(Correspondence of the Planters' Monthly.)

The Relation of Soils to the Air.—The presence of air in soils is of great importance, especially in connection with their water content and temperature; it is the cause of many momentous chemical processes. Since we know that full decomposition is impossible in the absence of air, it is obvious that ventilation to a certain extent is very necessary for a soil.

The Relation of Soils to Gases.—All soils possess more or less the power to absorb and condense gases. The absorption is a physical as well as a chemical one. This power grows as the amount of humus, hydrous oxyd of iron and clay increases.

The Relation of Soils to Water.—The power of imbibition, or absorption of water, is possessed by all soils to a variable extent. The absolute water capacity of soils is extremely varying; it depends greatly upon their mechanical conditions, structure, the presence of humus, and a few other circumstances. The more humus, clay or powdered lime a soil contains the more water it can absorb; the coarser it is and the more sand it contains, the less water is absorbed.

A soil with 10 per cent of water, or less, is called dry, because the amount of water is not sufficient for a normal plant growth; 20 per cent is the most favorable quantity for plants. With 30 per cent of water a soil can be called moist, and with 40 per cent or over it is termed wet.

Capillarity causes the even distribution of the soil water in the various layers. The capillary water is the water held in

the capillary spaces of the soil. If the water in the surface layers evaporates, an upward movement of the capillary water takes place, which is called surface tension. The capillarity is influenced very much by the different modes of cultivation; in fact, it can mostly be regulated by a proper cultivation as to be of the most benefit to the intended crop. This circumstance is of the greatest importance, for, no matter how fertile a soil may be, the method of cultivation should always conform to the nature of the soil, as well as the prevailing climatic and geological conditions. In places of moderate rainfall, deep plowing is only admittable on clay soils, whereas sandy soils will be benefitted more by shallow surface plowing. Deep plowing improves the capillarity in clay soils, but often disturbs it in sandy soils. At times it is necessary to roll sandy soils in order to compact the surface to restrain undue evaporation during a dry season.

Permeability or the ability to retain water is also a peculiarity of soils. When the texture of a soil is of such a nature that water cannot accumulate the soil is called permeable. Much water is lost during a rain by surface drainage, when it falls on hard compacted soil, especially clay soils. Deep plowing increases the permeability of such soils. Sandy and highly porous soils are in most cases permeable to a high degree. A sandy soil will quickly absorb a certain amount of water, but it will also readily yield it to the air again. On the other hand clay soils usually absorb the water slowly, but also hold the same with much tenacity. It is evident that the particular sizes, form and arrangement of the soil particles are greatly responsible for the permeability of a particular soil.

The soils are deprived of their water in different ways, and in view of the fact that these losses may in a great measure be controlled to suit the special crops and conditions, by means of proper cultivation, it is necessary to describe them.

Evaporation is caused by the escaping of the soil moisture into the air. It varies of course with the mechanical condition of the soil.

Sandy and porous soils give up their moisture more readily than others. Besides the evaporation is controlled by the temperature of the soil and air, the humidity of the air as well as its rate of movement.

Percolation is the downward movement of the soil water after the soil has been saturated. This water is lost into the subsoil but if conditions are favorable it will there be preserved for the future, as it is subsequently drawn up again by means of the capillary power in the soil.

Transpiration is caused by the leaves of plants. During hot and dry weather the leaves of plants are often seen to wither because the loss by transpiration exceeds the amount of water taken out of the soil by the roots.

The Relation of Soils to Heat and Cold.—The specific heat* of a soil is largely dependent upon its moisture and humus content as also water holding power. The main source of heat in the soil is the solar heat, but heat is also generated in the soil itself from chemical reactions, due to a slow oxidation of the organic matter. The relative temperature of a soil depends upon its texture and moisture content but also upon its color. Dark soils absorb more heat than light ones. The presence of water modifies the power of absorbing heat, for much heat is consumed in the evaporation of parts of the water. Whether a soil is a good or poor conductor of heat is determined by its composition and structure. Silica is the best conductor of heat; after this follow the oxyd of iron, lime and clay in the order given; humus conducts heat very poorly. The more compact a soil is and the larger its soil particles are the better it conducts heat; the same thing applies to wet soils as compared with dry ones, for water is a better conductor than air. The better a soil conducts heat the more it is of course subjected to fluctuations in temperature, conforming to the change of temperature of the atmosphere.

The color of soils is mostly imparted by one or more of their constituents. Lime soils are whitish, peat and bituminous soils are dark till black, while a yellow, red or brownish color indicates the presence of iron compounds. The more organic matter it contains the darker a soil gets.

From what has been stated in the preceeding chapter, we shall not go wrong if we assume that a careful study of the

*Specific heat of a soil is the relative amount of heat required to raise a given weight of the soil 1° Cs, as compared with the same weight of water. The specific heat of water being =1.

physical properties of his soils is of great importance to every husbandman. It should form the basis of soil study for it furnishes invaluable hints in regard to their probable agricultural value as also their most suitable and profitable treatment. It is just as important as the study of the chemical properties, which will be treated in the next chapter.

(To be Continued.)

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SOME UNLOOKED-FOR EFFECTS OF THE SUGAR TAX.

Mr. Sigmund Stein, of Liverpool, the well known sugar expert in England, informs us that the date of the International Conference, at Brussels, on the abolition of the foreign sugar bounty system will be fixed in a fortnight; he expects the conference to assemble in about a month's time. Reports are in circulation that the conference will not take place after all; but these, Mr. Stein says, are put about by Continental beet-root growers and sugar manufacturers, who, having been paid heavy bounties by their respective Governments on all sugar exported by them to England for 60 years past, do not relish the loss of their fat perquisites, and are doing their best to discredit the negotiations.

Mr. Stein's, however, is official, and he is also able to state that the conference will result in the total abolition of the sugar bounty system, which has had an existence since 1860. France has already reduced the bounty paid to her exporters by 30 per cent.; she will now "go the whole hog" with the rest of the Continental Governments, and what is more, the English plenipotentiary has been instructed to fall in with the general arrangement—and England has hitherto been the chief obstacle, because she grows none of her own sugar, imports it from France and Germany, and being the principal customer of these countries has dictated her fiscal policy in the past.

The consent of the English Government to the abolition of bounties marks a decided departure from her policy of so-called free trade, and will, in all probability, provoke a low outcry from the Cobdenites.

The incident should be an instructive lesson to those British shipowners who are agitating for the establishment of shipping bounties, and have secured the appointment of a Parliamentary Committee to take evidence on the whole subject. Having consented to the abolition of sugar bounties,

which they do not pay, the British Government are scarcely likely to consent to the imposition of shipping bounties which they would have to pay.

Chatting with Mr. Stein as to the working of the sugar tax, a "Dispatch" man was informed yesterday that sugar was never so cheap as it is today, despite the tax.

"That seems odd," the reporter remarked. "How can a tax on an article cheapen it?"

"Well, in the first place," remarked Mr. Stein, "foreign beet-root growers anticipated the date of the tax by an enormous inrush of sugar to escape duty, and the warehouses in this country were congested. Secondly, there has been a great increase in the sugar crop abroad, for which there is little demand in the countries where the sugar is grown, and it has been thrown on the British market in order to earn the bounty, with the usual cheapening that follows the excess of the supply of any article over the demand."

Will the abolition of bounties raise the price of sugar to the consumer? Mr. Stein thinks not. It ought to do so, one would think at first, because it is the payment of bounties by foreign Governments on sugar exports to England that enables the growers to sell at less than cost price. Take away the bounties, and the consumer will have more to pay for his sugar. That seems the logical result; but though there may be a rise in the price of sugar when bounties are abolished, Mr. Stein is of opinion that it will be only temporarily a rise, as was experienced when the import tax was imposed; presently the market will readjust itself to the changed conditions, and sugar will be as cheap as ever again.—Liverpool Paper.

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The banana seems much to the front at the present day, and comes in for a good deal of laudation; the banana plant, says M. de Lovedo, in El de Progress Mexico, will feed 150 men from the product of one hectare of land so planted; while the same area in wheat would only supply food for six individuals; for the same space and under similar conditions of cultivation, its produce is 40 times that of potatoes and 100 times that of wheat. The fruit of the banana contains 72 per cent. of water, 2.14 per cent. of nitrogenous matter, and 22 per cent. of saccharine substances, the latter giving it its great nutritive quality.

THE RUSSIAN EMPIRE.

Referring to the popular tendency to regard Russia as numerically far superior to any other civilized power the New York Tribune analyzes the latest Russian census and compares it with those of other countries as follows: "The census of nearly four years ago showed the Russian Empire to contain about 129,000,000 persons. No census has been taken since, but a computation has been made of the yearly excess of births over deaths, and thus it is calculated that the population has by this time risen to 136,000,000. That is a large number. But it must be borne in mind that it includes a number of heterogeneous and semi-hostile elements. There are, for example, some 9,000,000 Poles, who are almost literally pinned fast to Russia with bayonets, and more than 6,000,000 Finns, who are being alienated in spirit with rapidity and success. There are nearly 6,000,000 Lithuanians and 11,000,000 Turks, and there are 4,000,000 Jews who are held in semi-servitude and semi-outlawry. These and other alien elements are not commingled with the whole mass, but remain apart from it in distinct communities. Deducting these, the real Russian population is found not to exceed about 86,000,000.

"These latter figures exceed those of any other civilized nation, but not by an altogether overwhelming majority. The population of Germany, which is practically homogeneous, is about 55,000,000. If to this we add the 10,000,000 Germans of Austria we have a race comparison of 65,000,000 Germans to 86,000,000 Russians. For political purposes we may well add to the Germans the 13,000,000 Magyars and others of Hungary who are not only non-Slav, but also anti-Slav, thus making a total of 78,000,000. The United Kingdom has a population of only 41,000,000; but if we add the British population of the Empire we have a total of about 52,000,000. Finally, there is the United States, with a substantially homogeneous population of 77,000,000, which comes not so far from Russia's total of true Russians; and if we add together the population of the United States and the English-speaking population of the British Empire we have an Anglo-Saxon race total of 129,000,000, far exceeding the Russian total and approximating to the grand aggregate of the whole heterogeneous Russian Empire.

"The rate of increase is also to be considered. The increase

—including all gained by conquest and annexation—has thus been 61,000,000, or about eighty-one per cent in forty years. That is much more rapid than the growth of Germany, which has been only about fifty-two per cent, or of the United Kingdom, which has been only forty-one per cent. But while Russia has gained millions by annexation these others have lost millions by emigration. A far different comparison is that made with the United States. Apart from what we have gained by territorial expansion the domestic population of the United States has increased in forty years from 32,000,000 to 77,000,000, or more than one hundred and forty per cent. It will therefore not require many years for the United States to outstrip the population of Russia proper, and indeed its overtaking of the whole Russian Empire is within a measurable distance."

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WAR UPON THE BEET SUGAR INDUSTRY.

A short time ago formal announcement was made to the effect that the American Sugar Refining Company, commonly known as the Sugar Trust, was about to increase its capital stock by the amount of $15,000,000, and there has been much speculation in business and financial circles as to what purpose the company had in view. It now seems probable that one of the objects of the company is to hinder the steadily growing beet sugar industry of the United States.

This is a scheme that seems almost incredible, but there is no getting over the fact that the industry in question has no more determined enemy than those who are interested in the importation and refining of foreign sugars. It behooves every public spirited and fair-minded man, in Congress and out, to do what in him lies to defeat the plans of those who would fain ruin what is in reality one of the most important and promising industries ever set on foot in the United States. It is an industry which, if given fair play, will in a few years' time render this country independent of foreign sugars, and in that fact lies the secret of the animosity of the enemies of that industry.

According to a census report, the period of marked activity in connection with American beet sugar production began in 1896. Since that time thirty-five factories have been built. The census year ending May 31, 1900, was a bad year for the industry, for the beet crop was a partial failure; thirty-one

factories, however, were in operation and they produced 35 per cent of our total sugar production, while ten years earlier the output of beet sugar was less than 2 per cent of the domestic output.

A hopeful sign is the firm belief of capitalists who are investing in factories that beet sugar has passed the experimental stage in this country. With few exceptions the factories built within the past ten years are large, substantial buildings designed with a view to accommodate so much machinery that their present output may at least be doubled in the future.

The beet is now yielding more than a third of our domestic sugar product and factories are earning a fair return on their investments, though several lost heavily in 1899 on account of the failure of the supply of raw material.

The chief representative of the beet sugar industry is the American Beet Sugar Company. This company, it will be remembered, was incorporated in March, 1890, with a capital stock of $19,000,000, in $4,000,000 of preferred stock and $15,000,000 of common, taking over various previously independent concerns, the principal ones being those that had been established by Mr. Henry T. Oxnard, of California.

It is against this company that the Trust and Spreckels syndicate are directing their principal warfare.

The Spreckels syndicate is reported to have given orders to its brokers west of the Missouri river not to sell any beet sugar—to sell, in fact, no sugar whatever except such as has been made by the syndicate itself. Recently the syndicate, it is claimed, attempted to persuade the grocers of Denver to promise to make 75 per cent of their entire trade in the product of the trust. In other words, the beet sugar interests have incurred the enmity of the sugar syndicate, which is making every effort to ruin the business of the American Beet Sugar Company.

Recently the syndicate reduced the price of its product in the West one-fourth of a cent a pound, and increased it in the East, where there are no beet sugar factories. This, of course, forced the American Beet Sugar Company to cut prices. This company has recently bought 80,000 acres of land in the Arkansas Valley and expects to erect a factory there.

The syndicate handles crude sugar, bringing it from Hawaii, Java, India and the West Indies, and refines it and sells

it as American sugar. So it will attempt at the next session of Congress to have the duty on crude sugar lowered, and perhaps abolished. Should it succeed it would be disastrous to the beet sugar industry, which is in its tender infancy.

If it is aided and encouraged, as it ought to be, the United States will in a few years' time be producing at home all the sugar it needs—say $100,000,000 worth yearly—and will also have a large surplus for export. It is a matter that concerns the farmers of no fewer than twenty states, California, Michigan and Colorado being the principal ones, in which the industry is at present most largely represented.

The newspapers everywhere will do well to take up this matter in good time, inaugurate an educational campaign, so to speak, which shall show the public in general, and our national legislators in particular, why the reduction of the duty on raw sugars should not be attempted for some considerable time to come, and why all should do what they can to help build up an industry that means so much to the whole country as does that of beet sugar production.

It is quite certain, however, that the American Beet Sugar Company will fight to the last ditch, and it is even safe to predict that in the long run it will win the day. It certainly has the cordial sympathy of the vast majority of those who understand the situation.—Commercial and Financial World.

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FIGHTING THE MOSQUITO.

An Interesting Experiment.

The first battle in the war which is to be waged against the mosquitos of Staten Island, N. J., was fought recently by Dr. Doty, Health Officer of the Port; Edwin M. Skinner, Chief Engineer of the department; five laborers and three policemen on one side; and the mosquito larvae in four ponds around Concord on the other. Reports from the invaders are that the enemy was exterminated. The fight will be continued for some time in more of the favorite haunts of the enemy, and in time it is hoped that the pest will be only a memory on Staten Island.

Within a radius of a mile of the place there are ten ponds and pools of stagnant water where millions of mosquitos have been hatched and driven over the island by every breeze. There is much malaria in Concord, especially among the

children, and specimens of the anopheles or malaria-carrying mosquito have been hatched from the lavae in these ponds by Dr. Doty. Even the culex, which do nothing more dangerous than to bite, are large and voracious.

For weeks Dr. Doty has been conducting experiments, the people of Concord collecting specimens of the insects for him. When he appeared there dozens of children flocked about him with the test tubes provided by the Health Officer filled with mosquitos. Among the insects Dr. Doty recognized many of the anopheles variety.

For the purposes of the test, crude oil was used, the Standard Oil Company having placed as much of this material at Dr. Doty's disposal as he might find it necessary to use. The wagon built by Chief Engineer Skinner carried a tank containing ten barrels, or 500 gallons of oil. Above this is a cylinder containing compressed air at a pressure of 2,000 pounds to the square inch, with which to force the oil through the hose attached to the tank and into the sprayer. The sprayer is designed to sink about a foot and a half below the surface of the water. It is built like a wooden raft, and beneath there is a gridiron of iron piping in which small holes have been drilled. The oil is forced by a pressure of about thirty pounds into the sprayer under the water, to the top in which it rises in a thick, black, greasy mass.

Dr. Doty's investigations have been shown him that the larvae are deposited about six inches below the surface. When the "wiggles" come out of the eggs they rise to the surface from time to time to breathe. The object of forcing the oil under the surface is to destroy the eggs.

Men were set to work cutting down the grass around the ponds. Then the raft was launched and dragged across the ponds by the laborers, the oil the while being forced through the pipes. In half an hour the ponds looked like pools of petroleum in the oil regions.

It was easy to locate Dr. Doty. When the wind blew in the direction of the visitor he could smell, though ten blocks away, the scene of operations. Oil was also sprinkled from cans on the grass in the vicinity of the ponds.

One of the largest ponds was in the rear of the hotel of Henry Muller the "Mayor of Concord." Muller was dismayed when he saw the swimming places of his ducks destroyed. The fowl, after the sprayer had done its work started to go

back to the pond, but the odor of the oil drove them away. The surface of the ponds will be covered with oil for at least a month.

DESTROYED MILLIONS OF THEM.

"The test has been eminently successful," Dr. Doty said at the conclusion of the work "The apparatus worked finely and everything we figured on doing was done. I have no doubt that we have destroyed millions of mosquitos, for my experiments show that a drop of oil is almost instantly fatal to larvae and the 'wigglers.' When the ponds have been flooded with oil we will stop and note the result. The people in the neighborhood have promised to report to me.

"I am convinced that the grown pests will be driven away too. The smell will accomplish this in part and when they find that their breeding places have been destroyed they will depart for other fields."—*New York World.*

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THE FUTURE OF THE WEST INDIES.

For some time there has been considerable public discussion as to the future relations between the United States and Cuba. Some people are inclined to the idea that a protectorate will be formed; others seem to think that annexation pure and simple will be the result; and the latter policy is receiving an ever increasing support. In this connection an important article appeared in a recent issue of the New York Journal of Commerce, reproduced in the Louisiana Planter of the 27th ult. The United States, as we know, is at present the principal, almost the only, market for West Indian sugars, thanks to the preference given them by the imposition in the States of countervailing duties on the bounty-aided European products. But if the capitalists of the United States develop the Cuban industry on the lines indicated by The Journal of Commerce, these West Indian colonies will in the near future be face to face with a situation, darker, graver, and more hopeless than, perhaps, they have ever yet experienced. Whether annexation takes place or not, it is abundantly clear that the Americans mean to develop the remarkably fertile resources of Cuba, as well as those of Porto Rico and the Philippines, on a very extensive scale, and the results of such development, supported by free admission of the products to the United States markets, are bound

to have a very serious effect on our sugar market, and, consequently, upon our future prosperity. While our sugars may continue to obtain preferential treatment as regards the bounty-fed beet, they will be utterly unable to compete against the protected trade of Cuba and the growing American colonies. The annual consumption of sugar in the States is 4,000,000,000 pounds per year, or only twice Cuba's average production in her most prosperous years. With American capital at command, and American methods of cultivation adopted, the Cuban sugar harvest is bound to speedily increase, and the effect of the free entry of this vast amount on the American market would spell disaster to the West Indian products. To show that this is no mere fancy an analogous case is given in the history of Hawaii. In 1876 a reciprocity treaty was entered into between the United States and Hawaii, whereby the sugar of those islands was admitted into the United States free of duty. Prior to that date the average production of sugar in the islands was about 25,000,000 pounds per annum. In five years the production had trebled, in fifteen years it was ten times as much, and in twenty years twenty times as much as before. Within less than ten years after the ratification of the treaty more than $20,000,000 of American capital had been invested in the islands, and the total value of their sugar production since the treaty is $250,000,000. The figures show that the sugar production of the Hawaiian Islands has increased over 2,000 per cent under its free admission into the markets of the United States, "while the other cane producing islands and countries have during that time suffered great depression and, in many cases, heavy losses."

The example of Hawaii is held forth as an inducement to Cuba to take advantage of America's offer, for, "with free admission for her sugar into such a market her planters would grow rich, while similar advantages to other products in the markets of the greatest and richest nation in the world would assure success to every class of producers and general prosperity such as the island has never known." Discounting the tendency to boast of the nation's greatness, and the characteristic tendency to exaggeration, there is sufficient in this statement to make West Indians and people in this colony pause and take their bearings. If Cuba is admitted into the free market of the States, what is to become of our sugar?

It is admitted that the sugar states of America, with Porto Rico, Hawaii, the Philippines and Cuba could more than supply all the needs of the United States and, with protective tariffs, undersell all competitors. What is the British Government doing to enable her colonies to meet this contingency? While America by legislative enactments is doing everything in its power to develop the trade of her newly acquired possessions, is Great Britain to stand aside and let her old colonies go under without putting out a hand to save them? Surely not. Another Bounty Conference is announced to take place at Brussels. Hitherto all attempts to come to a satisfactory arrangement for the abolition of the bounties have proved abortive, simply because the British representatives could not assert that if the other countries interested did not put a stop to their bounty giving, Great Britain would retaliate with countervailing duties. If at the next conference Britain makes it clearly understood that she is prepared to enforce her views on the injustice of continental bounties to the extent of adopting duties to counteract their effect, in the same way as the United States and India have done, there will be some chance of the representatives of the Powers coming to an amicable and satisfactory arrangement—but we fear not otherwise. This is a matter that affects not merely the West Indies; it is one of vital importance to the United Kingdom and to the Empire as a whole. "Trade follows the flag," we are told by politicians at home, but this is only true to a certain extent. If the "flag" encourages the trade of the country on which it is placed, reciprocity is the natural result; but our experience in this respect has been that the Home Government's policy of laissez faire has been to encourage trade between the United States and this colony at the expense of our commercial relations with the mother country. In this connection it is interesting to note that ten years ago our imports from the United Kingdom amounted to £927,397, while last year they had dwindled to £762,187. On the other hand, the imports from the United States in 1891 amounted to £374,935, and last year they showed an increase to £381,356. These figures are significant enough, and it is but natural that the inhabitants of one country should encourage trade with the country that provides it with a market for its products. We cannot do better than re-echo the warning written by the editor of Our Western Empire, and direct

it as much to the British Government as to the English manufacturers. They have to face the probability that throughout the western world there will ere long be a sort of commercial sweeping of the board by the United States unless they put their shoulder to the wheel; while our working classes and our doctrinaire politicians will do well to consider whether as a whole the Empire is worth retaining, and if it is, whether a large, and one of the oldest portions of it—to-wit, the West Indies,—is to be cast aside, ruined, and ultimately lost, in order that the British workman may effect an inappreciable saving per annum in the cost of the sugar he puts into his tea."—Demarara Argosy.

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The New York Independent says: It is hardly worth our while to grumble at the amateur politics in Hawaii; the little island has brought into the United States some institutions, of the value of which we are convinced, but have not yet been able to secure for the Union at large. Democracy moves slower in reform than monarchy; but it moves exactly with public sentiment. Two Hawaiian achievements are postal savings banks and the preservation of beautiful highways. Every land owner must not only keep the highway in order, but he must see to it that on either side there is no defacement. He must even leave a border of 150 feet free of cultivated crops (?). That is, on either side of all roadways, there must be a garden of shrubs, trees and flowers (?). Not one advertisement defaces a Hawaiian roadside. Now that the Islands have become a part of our Union will they be given over to advertisements? Really, the worst part of this whole business is, that we are getting used to it—it no longer disturbs us to travel billboarded miles. When Thoreau was told that he would get used to affairs, as they existed in a certain town of smoke, grime and noise, he replied that he certainly would not remain—for to get used to such things would be to be deaf to music and blind to beauty.

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Emerson well said: "Life is not so short but that there is always time enough for courtesy." But the touchstone of our manners is often found in the way we treat our servants and the members of our own family. Rothschild, Lawrence, Brooks and many other millionaires treated their servants as politely as their customers.

SAN JOSE SCALE IN AUSTRALIA.

This coccid seems to be steadily spreading over all parts of the State of New South Wales, and though there are a number of practical orchardists who have successfully checked its spread in their orchards, it is present in hundreds of orchards scattered all over the State, and will soon be the universal pest to stone and pip fruits that Red Scale is to the citrus fruits. It is quite a common thing to see apples in the fruit-dish in restaurants and private houses covered with the tell-tale white dots, ringed with red, whence the scales have been rubbed off; and upon all such fruit one can find a few live scales securely tucked away in the eye of the fruit. Though probably in some cases this scale may be introduced on fruit into a clean orchard, not so much from the fruit as from the empty cases, yet in most cases it is introduced in fresh trees. I have had several cases brought under my notice of wood for budding being sent to nurserymen which had several scales hidden under the dormant buds, from which quite enough larvae could be propagated to form a big colony.

Every orchardist and nurseryman should submit any peach, apple, and wood to a careful examination before using it in their orchards. In spite of many warnings, a section of our fruit-growers take no notice of San Jose Scale in their orchards, sending fruit to market covered with disease, and never treating either trees or fruit; but all growers must look for an export market some day, and then from the carelessness of the few all our fruit will be shut out of the world's markets. In other parts of the world a very keen interest is taken in the spread and control of this pest. The authorities at Washington, U. S., despatched Mr. C. L. Marlatt, Assistant in the Entomological Division of the Department of Agriculture, to Japan last March to collect and forward any natural enemies of this scale that he could find in that country, which is supposed to be its original home before it appeared in America.

Though only last year Tasmania closed her ports against all kinds of plants and trees from her sister States, on the ground of the danger of introducing San Joe Scale, she has now discovered that there are a number of orchards in the New Norfolk district that have been infested for a number of years. The authorities are not standing still, however, but

bringing in regulations to at once deal with the pest and confine it to the infested localities.

In Canada, where San Jose Scale has gained considerable hold in several districts, most energetic methods are being made to keep it under control, both by the Federal and Provincial Governments. Fletcher says: "Not only is every woody-stemmed plant imported from Canada from infested countries fumigated with hydrocyanic gas, but every nurseryman in Ontario is forced to submit to the same treatment every shrub and tree supplied to customers."

It is rather curious how slowly this scale spreads in some districts, while in other places it goes in leaps and bounds, but one of the chief reasons is, I believe, a parasitic moth that feeds upon it in the Coastal Districts in particular. The slender, brownish caterpillar feeds upon the "white louse" (Chionaspis citri), another common scale upon the citrus trees, forming a protective web all over the trunk and branches, eating off the scale as it moves along. I have also found it plentiful upon an undetermined Aspidiotus on a eucalyptus near Goulburn. When full grown they form slender silken cocoons, generally several side by side, attached to the bark of the tree. In the last number of this Journal, 1897, I noted this moth larvae, as well as the small black ladybird beetle (Rhizobius debelis, Black) feeding upon San Jose Scale at Berowra. This moth has since been bred in considerable numbers, and has been identified as (Batrachedra sparsella, Walk.) one of the family Elachistidae. The moth measures slightly over half an inch across the outspread wings; the head, thorax, and fore wings are buff colored, with the hind pair lighter in tint; antennae, legs, and abdomen more silvery. The head is short, eyes distinct, antennae long and slender. The fore wings are very narrow, long, slender at the tips, fringed with fine plumes on the hind margin; in the hind pair the central portion of the wing is very narrow, with short plumes fringing the front margin, and long feathery ones along the hind margin.—N. S. W. Ag. Gazette.

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The word "Kanaka" so well known in connection with Polynesian indentured laborers in Queensland, was derived from the word for "man" in the Hawaiian dialect. Two Hawaiian words—Kanaka (man) and Maikai (good) have been anglicised.

The chief camphor-producing country is Formosa, where it is a Japanese government monopoly. The reason for making it such appears to have been, among other reasons, the reckless destruction of trees and the great fluctuations in price, as well as the want of uniformity in quality in the article previously. The government has passed strict forest regulations, and by wire forest administration Formosa is capable of supplying the world with 6,000,000 or more pounds (English) of camphor annually. The quality is established, and the price fixed not only locally but abroad. Tenders are invited for the lowest price of sale in foreign markets, and in March, last year, the monopoly of sale in foreign markets was secured by Mr. T. Arai of Messrs. Samuel, Samuel & Co. The above interesting facts are recorded in the Brisbane Courier.

Cattle with spectacles are to be seen on the Russian steepes. The steepes are covered with snow more than six months of the year. The cows subsist on tufts of grass which crop above the snow, and the rays of the sun on the snow are so dazzling as to cause blindness. To obviate this calamity, it occurred to a kind-hearted man to protect the cows' eyes in the same way as those of human beings, and he manufactured smoke-colored spectacles which could be safely worn by cattle. These spectacles were a great success, and are now worn by upward of 40,000 head of cattle, who no longer suffer from the snow-blindness which once caused such suffering among them.

It will be a surprise to the uninitiated that the New York Legislature has passed a bill, at last, giving limited suffrage to women—that is, the right to vote on questions involving appropriations in villages and towns. Notwithstanding the opposition of some few men and women the bill passed by a very handsome majority, in the Senate by a vote of 27 to 14, almost two to one. But this is very far from a vote for general suffrage. At most, the woman, or the camel, only has a nose as yet in the booth.

Some sensation has been produced by a new sugar process that has been kept secret from the public, but the method is gradually being made known. It was claimed by the inventor that the residuum scums contained four times the amount of

salts as is found in the residuum from all other modes of working. By repeated analysis of the scums a general idea was had of the purifying agents used; these are said to be sulphite of alumina, lime and chloride of barium. The swing-outs from first grade sugars are heated in a special mixing vat, about 53 lbs. of sulphite to 800 gallons syrup. This after being thoroughly mixed is reheated to 80° C. (176° F); after a certain period 20 lbs. of oxide of calcium is added, and later 55 lbs. of chloride of barium. The syrups thus prepared are added to the diffusion juices and are worked up as usual.—The Sugar Beet.

ANTISEPTICS FOR THE MOUTH.—There would be much less sickness than is at present the case if it were generally known that washing out the mouth and gargling the throat frequently with an antiseptic solution is a good preventive of disease, and a safeguard against sore throat. One of the best antiseptics for the purpose is a very weak solution of carbolic acid—not more than three drops of the acid to a tumbler full of water. A weak solution of Condy's fluid is also useful. A great many common throat and lung diseases proceed from the lodgment of diseased microbes within the mucous membranes of the mouth. A free use of antiseptics will kill these germs. Aclean, wholesome feeling of the mouth follows the daily rinsing and gargling with an antiseptic lotion.

EVAPORATED BANANAS.—You'll see something new in a food product this fall, said an Eastern wholesale fruit dealer. It's evaporated bananas. A syndicate has been formed, backed by American capital, to put them on the market. From letters I have received from New York dealers, I understand the industry will be introduced into probably all the banana producing districts. For the purpose of evaporation the thoroughly ripe banana is placed in an oven and subjected to heat from 24 to 48 hours. The sugar crystalizes on the outside. The evaporated product is then packed in five-pound boxes and wholesales at ten cents a pound. It takes six pounds of fresh fruit to make one pound of evaporated, hence the economy in space in transporting is important, to say nothing of the saving in preventing decay in transit. In a small way the evaporated fruit has been introduced in this country, Germany, Norway, Sweden and Denmark, and so far have given satisfac-

tion. Confectioners like the evaporated banana as a basis for candied fruits, and bakers can use them in a variety of ways. —N. E. Grocer.

The establishment of free trade between the United States and Porto Rico has given a new stimulus to the Cuban economical corporations to resume the agitation, both in this island and in the States, with the object of obtaining a reduction in the duties levied on Cuban products, since the removal of duties on Porto Rican sugars and tobacco places that island in a highly advantageous position with regard to sugar, as compared with Cuba, Java, the British West Indies and other cane sugar producing countries. It is doubtful whether Cuba can obtain any reduction of duty on her sugars, without making large concessions on her part.

In the course of a speech in the Lower House of the Hungarian Diet, Dr. Lukacs, Minister of Finance, alluding to the question of the sugar bounties, said he hailed with joy the indications of the decline of the bounty system. At the same time, however, the abolition of the sugar bounty must be brought about by international arrangement. The Government, continued the speaker, has, moreover, invested itself with authority in the Sugar Tax law to provide, should the contingency arise, for the reduction or abolition of the bounties by administrative decree. The Minister added that, in spite of the new Indian countervailing duties, there was a satisfactory increase in the Hungarian sugar exports.—Sugar.

During the year 1900, the imports of sugar into the United States were as follows: Dutch East Indies, $24,170,000; Hawaii, $20,392,000; Cuba, $18,244,000; Germany, $12,347,000. Smaller importations came from British West Indies and Guiana, San Domingo and Porto Rico. Small imports came from Egypt, Austria, Brazil and Peru.

A special law has been passed exempting sugar from taxation when it is used for the manufacture of transparent soap. A special clause, however, is that the soap must not be exported to any foreign country or colony. For some unknown reason an exception is made for Algiers.

HONOLULU STOCK AND BOND EXCHANGE, DEC. 12, 1901.

STOCK	Capital Authorized	Shares Issued	Capital Paid up	Par Value	Last Sale
MERCANTILE					
C. Brewer & Co	$ 1,000,000	10,000	$ 1,000,000	$ 100	415
N. S. Sachs' Dry G'ds Co. L'd.	60,000	600	.....	100	100
L. B. Kerr & Co., Ltd	200,000	4,000	.....	50	
SUGAR					
Ewa Plantation Company	5,000,000	250,000	5,000,000	20	24
Hawaiian Agricultural Co	1,000,000	10,000	1,000,000	100	270
Hawaiian Com'l & Sugar Co.	10,000,000	100,000	2,312,750	100	80
Hawaiian Sugar Company	2,000,000	100,000	2,000,000	20	30
Honomu Sugar Company	750,000	7,500	750,000	100	130
Honokaa Sugar Company	2,000,000	100,000	2,000,000	20	33¼
Haiku Sugar Company	500,000	5,000	500,000	100	.....
Kahuku Plantation Company	500,000	25,000	500,000	20	24
Kihei Plant. Co. Ltd.,	2,500,000	50,000	2,500,000	50	10
Kipahulu Sugar Company	160,000	1,600	160,000	100	....
Koloa Sugar Company	500,000	5,000	500,000	100	164
McBryde Sug. Co. Ltd.	3,500,000	175,000	3,500,000	20	10
Oahu Sugar Co	3,600,000	36,000	3,600,000	100	100
Onomea Sugar Co	1,000,000	50,000	1,000,000	20	24
Ookala Sugar Plantation Co.	500,000	25,000	500,000	20	9
Olaa Sugar Co. Ltd., Assess.	2,500,000	125,000	865,000	20	2
Olaa Sugar Co. Ltd., Paid up	2,500,000	125,000	2,500,000	20	11
Olowalu Company	150,000	1,500	150,000	100	.....
Paauhau Sug. Plantation Co.	5,000,000	100,000	5,000,000	50	.....
Pacific Sugar Mill	500,000	5,000	500,000	100	.....
Paia Plantation Company	750,000	7,500	750,000	100	250
Pepeekeo Sugar Company	750,000	7,500	750,000	100	.....
Pioneer Mill Company	2,250,000	22,500	2,250,000	100	100
Pioneer Mill Company Ass.	500.000	5,000	125,000	100	25
Waialua Agricultural Co	4,500,000	45,000	4,500,000	100	55
Wailuku Sugar Company	700,000	7,000	700,000	100	370
Waimanalo Sugar Company	250,000	250,000	250,000	100	160
Waimea Mill Company	125,000	125,000	125,000	100	87
MISCELLANEOUS					
Wilder Steamship Company	500,000	5,000	500,000	100	100
Inter-Island Steam Nav. Co.	600,000	6,000	600,000	100	100
Hawaiian Electric Company.	500,000	5,000	500,000	100	110
Honolulu R. T. & Land Co.	250,000	2,500	250,000	100	94½
Mutual Telephone Company	150,000	13,900	139,000	10	8
Oahu Railway & Land Co	4,000,000	40,000	4,000,000	100	95
BANKS					
First National Bank	500,000	5,000	500,000	100	.....
First Am. Sav. B. & Trust Co.	250,000	2,500	250,000	100	.....
BONDS	Amt. of Issue				
Hawaiian Govt. 5 per cent	1,251,200	Dec. 31, 1900	.....	.....	96
Hilo Railroad Co., 6 per cent	1,000,000	750,000	.....	.....	100
Hono. R. T. & L. Co , 6 p. c.	300,000	.....	.....	.....	.....
Ewa Plantation 6 per cent	500,000	.....	.....	.....	101½
Oahu Railway & L'd Co. 6 p. c.	2,000,000	.....	.....	.....	104½
Oahu Plantation 6 per cent.	750,000	.....	.....	.....	100
Olaa Plantation 6 per cent	1,250 000	.....	.....	.....	.....
Waialua Agr. 6 per cent	1,000,000	.....	.....	.....	101

PLANTATION DIRECTORY.

Island and Name.		Manager.	Post Office
OAHU.			
EwaPlantation Co	*	G. F. Renton	Honouliuli
Waianae Sugar Co. Ltd	***	Fred Meyer	Waianai
Waialua Agricultural Co	*	W. W. Goodale	Waialua
Kahuku Plantation Co	xx	Andrew Adams	Kahuku
Waimanalo Sugar Co	**	G. C. Chalmers	Waimanalo
Oahu Plantation Co	x	Aug. Ahrens	Waipahu
Honolulu Sugar Co	**	J. A. Low	Aiea
Heeia Agricultural Co. Ltd	*x*	W. W. McGowan	Heeia
Laie Plantation	x*x	S. E. Wooley	Laie
MAUI.			
Olowalu Sugas Co	**	E. Kruse	Lahaina
Pioneer Mill Co	x	L. Barckausen	Lahaina
Wailuku Sugar Co	*x	C. B. Wells	Wailuku
Hawaiian Commercial & Sugar Co	x*	W. J. Lowrie	Spreckiesville
Paia Plantation	x*	D. C. Lindsay	Paia
Haiku Sugar Co	x*	H. A Baldwin	Hamakuapoko
Hana Plantation	xx	K. S. Gjerdrum	Hana
Hamoa Plantation	*x	J. R. Myers	Hamoa
Kipahulu Sugar Co	x	A. Gross	Kipahulu
Kihei Plantation	x*	James Scott	Kihei
Maui Sugar Co	†	W. S. Akana	Huelo
HAWAII.			
Paauhau Plantation	**	Jas. Gibb	Honokaa
Hamakua Mill Co	*x	A. Lidgate	Paauilo
Kukaiau Plantation	x	J. M. Horner	Paauilo
Kukaiau Mill Co	*x	E. Madden	Paauilo
Ookala Sugar Co	*x	W. G. Walker	Ookala
Laupahoehoe Sugar Co	*x	C. McLennan	Papaaloa
Hakalau Plantation	**	Geo. Ross	Hakalau
Honomu Sugar Co	**x	Wm. Pullar	Honomu
Pepeekeo Sugar Co	*x	H. Deacon	Pepeekeo
Onomea Sugar Co	**x	J. T. Moir	Papaikou
Hilo Sugar Co	**	J. A. Scott	Hilo
Hawaii Mill Co	x	W. von Graevemeyer	Hilo
Waiakea Mill Co	*x	C. C. Kennedy	Hilo
Hawaiian Agricultural Co	**x	C. M. Walton	Pahala
Hutchinson Sugar Plantation Co	**	G. C. Hewitt	Naalehu
Union Mill Co	*x	Jas. Renton	Kohala
Kohala Sugar Co	*	E. E. Olding	Kohala
Pacific Sugar Mill	x**	D. Forbes	Kukuihaele
Honokaa Sugar Co	x**	Jno. Watt	Honokaa
Kona Sugar Co	xxx	J. Cowan	Holualoa
Olaa Sugar Co	xx*	F. B. McStocker	Olaa
Puna Sugar Co	xx*	W. H. Campbell	Kapoho
Halawa Plantation	x*x	T. S Kay	Kohala
C. F. Hart, (Niulii)	*x	R. Hall	Kohala
Hawi Mill & Plantation	††	John Hind	Kohala
KAUAI.			
Kilauea Sugar Co	**	G R. Ewart	Kilauea
Gay & Robinson	x*x	Gay & Robinson	Makaweli
Makee Sugar Co	**x	G. H. Fairchild	Kealia
Grove Farm Plantation	x	G. N. Wilcox	Lihue
Lihue Plantation Co	x	F. Weber	Lihue
Kolon Sugar Co	x	P. McLain	Kolon
McBryde Sugar Co	*x	W. Stodart	Eleele
Hawaiian Sugar Co	x*	W. A. Baldwin	Makaweli
Waimea Sugar Mill Co	*	J. Fassoth	Waimea
Kekaha Sugar Co	x	H. B. Faye	Kekaha

Key	Honolulu Agents	
*	Castle & Cooke	(4)
**	W. G. Irwin & Co	(8)
***	J. M. Dowsett	(1)
x	H. Hackfeld & Co	(9)
xx	M. S. Grinbaum & Co	(2)
xxx	McChesney & Sons	(1)
*x	T. H. Davies & Co	(8)
**x	C. Brewer & Co	(7)
x*	Alexander & Baldwin	(5)
x**	F. A. Schaefer & Co	(2)
xx*	B. F. Dillingham & Co	(2)
x*x	H. Waterhouse & Co	(3)
x	C. Bolte	(1)
†	Wong Kwai	(1)
††	Hind, Rolph & Co	(1)

PLANTATION DIRECTORY.

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EwaPlantation Co	*	G. F. Renton	Honouliuli
Waianae Sugar Co. Ltd	***	Fred Meyer	Waianai
Waialua Agricultural Co	*	W. W. Goodale	Waialua
Kahuku Plantation Co	xx	Andrew Adams	Kahuku
Waimanalo Sugar Co	**	G. C. Chalmers	Waimanalo
Oahu Plantation Co	x	Aug. Ahrens	Waipahu
Honolulu Sugar Co	**	J. A. Low	Aiea
Heeia Agricultural Co. Ltd	*x*	W. W. McGowan	Heeia
Laie Plantation	x*x	S. E. Wooley	Laie
MAUI.			
Olowalu Sugas Co	**	E. Kruse	Lahaina
Pioneer Mill Co	x	L. Barckausen	Lahaina
Wailuku Sugar Co	**x	C. B. Wells	Wailuku
Hawaiian Commercial & Sugar Co	x*	W. J. Lowrie	Spreckelsville
Paia Plantation	x*	D. C. Lindsay	Paia
Haiku Sugar Co	x*	H. A Baldwin	Hamakuapoko
Hana Plantation	xx	K. S. Gjerdrum	Hana
Hamoa Plantation	*'x	J. R. Myers	Hamoa
Kipahulu Sugar Co	x	A. Gross	Kipahulu
Kihei Plantation	x*	James Scott	Kihei
Maui Sugar Co	‡	W. S. Akana	Puelo
HAWAII.			
Paauhau Plantation	**	Jas. Gibb	Honokaa
Hamakua Mill Co	*x	A. Lidgate	Paauilo
Kukaiau Plantation	x	J. M. Horner	Paauilo
Kukaiau Mill Co	*x	E. Madden	Paauilo
Ookala Sugar Co	**x	W. G. Walker	Ookala
Laupahoehoe Sugar Co	*x	C. McLennan	Papaaloa
Hakalau Plantation	**	Geo. Ross	Hakalau
Honomu Sugar Co	**x	Wm. Pullar	Honomu
Pepeekeo Sugar Co	*x	H. Deacon	Pepeekeo
Onomea Sugar Co	**x	J. T. Moir	Papaikou
Hilo Sugar Co	**	J. A. Scott	Hilo
Hawaii Mill Co	x	W. von Graevemeyer	Hilo
Waiakea Mill Co	*x	C. C. Kennedy	Hilo
Hawaiian Agricultural Co	**x	C. M. Walton	Pahala
Hutchinson Sugar Plantation Co	**	G. C. Hewitt	Naalehu
Union Mill Co	*x	Jas. Renton	Kohala
Kohala Sugar Co	*	E. E. Olding	Kohala
Pacific Sugar Mill	x**	D. Forbes	Kukuihaele
Honokaa Sugar Co	x**	Jno. Watt	Honokaa
Kona Sugar Co	xxx	J. Cowan	Holualoa
Olaa Sugar Co	xx*	F. B. McStocker	Olaa
Puna Sugar Co	xx*	W. H. Campbell	Kapoho
Halawa Plantation	x*x	T. S Kay	Kohala
C. F. Hart, (Niulii)	*x	R. Hall	Kohala
Hawi Mill & Plantation	††	John Hind	Kohala
KAUAI.			
Kilauea Sugar Co	**	G R. Ewart	Kilauea
Gay & Robinson	x*x	Gay & Robinson	Makaweli
Makee Sugar Co	**x	G. H. Fairchild	Koolia
Grove Farm Plantation	x	G. N. Wilcox	Lihue
Lihue Plantation Co	x	F. Weber	Lihue
Koloa Sugar Co	x	P. McLain	Koloa
McBryde Sugar Co	*x	W. Stodart	Eleele
Hawaiian Sugar Co	x*	W. A. Baldwin	Makaweli
Waimea Sugar Mill Co	*	J. Fassoth	Waimea
Kekaha Sugar Co	x	H. B. Faye	Kekaha

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xxx	McChesney & Sons	(1)
*x	T. H. Davies & Co	(8)
**x	C. Brewer & Co	(7)
x*	Alexander & Baldwin	(5)
x**	F. A. Schaefer & Co	(2)
xx*	B. F. Dillingham & Co	(2)
x*x	H. Waterhouse & Co	(3)
x	C. Bolte	(1)
‡	Wong Kwai	(1)
††	Hind, Rolph & Co	(1)